



13419 - The First Ultraviolet Survey of Orion Nebula's Protoplanetary Disks and Outflows

Cycle: 21, Proposal Category: GO

(UV Initiative)

(Availability Mode: SUPPORTED)

INVESTIGATORS

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VISITS

<i>Visit</i>	<i>Targets used in Visit</i>	<i>Configurations used in Visit</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
01	(1) M42-BOX1-TRAPEZIUM-SOUTH	ACS/WFC WFC3/UVIS	2	03-Dec-2014 21:00:49.0	yes
02	(1) M42-BOX1-TRAPEZIUM-SOUTH	ACS/WFC WFC3/UVIS	2	03-Dec-2014 21:00:51.0	yes
03	(2) M42-BOX2-TRAPEZIUM-WEST	ACS/WFC WFC3/UVIS	2	03-Dec-2014 21:00:53.0	yes

<i>Visit</i>	<i>Targets used in Visit</i>	<i>Configurations used in Visit</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
04	(2) M42-BOX2-TRAPEZIUM-WEST	ACS/WFC WFC3/UVIS	2	03-Dec-2014 21:00:55.0	yes
05	(3) M42-BOX3-TRAPEZIUM-NORTH	ACS/WFC WFC3/UVIS	2	03-Dec-2014 21:00:57.0	yes
06	(3) M42-BOX3-TRAPEZIUM-NORTH	ACS/WFC WFC3/UVIS	2	03-Dec-2014 21:00:59.0	yes
07	(5) M43-BOX5-BAR-SOUTHEAST	ACS/WFC WFC3/UVIS	2	03-Dec-2014 21:01:01.0	yes
08	(6) M42-BOX4-BEEHIVE	ACS/WFC WFC3/UVIS	2	03-Dec-2014 21:01:03.0	yes
09	(7) M42-BOX7-HH502	ACS/WFC WFC3/UVIS	2	03-Dec-2014 21:01:05.0	yes

18 Total Orbits Used

ABSTRACT

The Orion Nebula contains the nearest site of massive star-formation and the largest concentration of young stars, proto-planetary disks, and outflows in the Solar vicinity. Orion is a laboratory for addressing long-standing questions in the formation massive stars, star clusters, and the evolution of proto-planetary disks. A new WFC3 UV survey of the Nebula is proposed to resolve unprecedented detail in proto-planetary disks seen in silhouette, bright proplyds, and outflows, generating the first high-resolution UV images of a Galactic massive star-forming region. In the UV, nebular background provides a backlight 10 to 30 times brighter than at visual wavelengths. Low-mass young stars are much dimmer in the UV than in the visual, so disks previously hidden by stellar glare will be detected and characterized resulting in measurements of disk sizes. The color of radiation transmitted through the translucent dust in proplyds will probe grain growth. The UV MgII, violet [OII], and new H-alpha images will provide new constraints on disk mass-loss rates. By combining these measurements with our ALMA sub-mm determination of disk masses, disk life-times will be estimated. Outflows in the Nebula will be imaged for the first time in [OII] and [MgII] to probe the transition from neutral to ionized gas. Because of large proper motions, new WFC3 H-alpha images are required to register the MgII and [OII] data. The WFC3 H-alpha and coordinated parallel H-alpha imaging with ACS will be combined with archival HST images, to measure proper motions of nebular structures and outflows with unprecedented precision.

OBSERVING DESCRIPTION

UV imaging with WFC3 provides the highest angular resolution ever obtained with HST, $\sim 0.035''$, a factor of two better than HST in H-alpha. Exposures will use sub-pixel dithering to recover the best resolution using multi-drizzle. Two broad-band filters are needed to determine the spectral index (colors) of the background light in the Nebula and the change in color caused by foreground dust associated with disks, protoplanetary disk-winds, and outflows. These data will be combined with archival longer wavelength HST images to determine grain properties such as grain sizes. While interstellar dust reddens background light, large grains produce grey, extinction nearly independent of wavelength. Most of the UV continuum is produced by normal ISM dust scattering in the ionization front at the rear of the nebula (e.g. Mathis et al. 1981).

Nine fields will be observed with five WFC3 filters; F225W, F336W, F280N (MgII), F373N ([OII]), and F656N (H-alpha). Previous H-alpha studies have shown that outflow proper motions are detected on HST images obtained 1 to 2 years apart. New H-alpha images are needed for the fields being observed in the UV to measure the relative locations of the various emission regions in the current epoch. The WFC3 H-alpha images will require only a small fraction of the observing time. CR-SPLIT pairs of dithered images will be obtained to fill-in the inter-chip gaps. These observations will provide the first high-resolution and sensitive UV observations of a Galactic star forming region appropriate for determining the size distribution and mass-loss rates of proto-planetary disks and their outflows.

Exposure times and Sensitivity of WFC3: HST/WFC3 has a throughput ranging from 8% in the F225W filter to about 18% in the F336W filter. Although this is a factor of three to four lower than the throughput of the filters around 600 nm, the order-of-magnitude increase of the background surface brightness more than compensates for this inefficiency. The UV continuum flux of the nebula has been measured with IUE (Mathis et al. 1981). From the Huygens core behind the Trapezium to the outer nebula 4' West and 3' North of the Trapezium, the measured continuum fluxes range from 7 to 90×10^{-16} erg s^{-1} arcsec $^{-2}$ \AA^{-1} at 200 nm, to 4 to 50×10^{-16} erg s^{-1} arcsec $^{-2}$ \AA^{-1} at 300 nm. According to the WFC3 ETC, the photon count rates in the F225W and F336W filters will be 0.2 to 3.2 s^{-1} per WFC3 pixel in the F225W filter to 0.4 to 5 s^{-1} per pixel in the F336W filter, yielding S/N ratios of 10 to 70 with exposure times of 2×900 seconds. The violet [OII] lines have fluxes ranging from 1 to 10×10^{-13} erg s^{-1} cm $^{-2}$ arcsec $^{-2}$ (Rubin et al. 1998). The ETC indicates that a pair of 900 sec exposures will yield counts ranging from 2 to 25 photons per second in each WFC3 pixel, yielding a S/N of 40 to 140. MgII exposures will be comparable to [OII]. H-alpha exposures of 2×500 seconds are needed (as in previous HST programs).

Coordinated Parallel observations with ACS: We propose to use the ACS WFC to observe portions of the Orion Nebula in coordinated parallel mode.

Proposal 13419 (STScI Edit Number: 1, Created: Wednesday, December 3, 2014 9:01:07 PM EST) - Overview

Prior WFPC2 H-alpha images (GO 8324) and our Cycle 11 and 12 ACS programs (GO 9460 and GO 9825) show that everywhere in the proposed grid (Figure 4), half-orbit integrations in the F658N filter (which includes the H-alpha and 658 nm [NII] line) provide sufficient S/N to resolve proplyd structure, detect disks in silhouette against the background nebula, identify H-alpha bright shocks associated with outflows, and resolve their structure.

The WFC3 grid will drive the ACS grid, which will be over-sampled. Since two orbits will be devoted to each field, we propose to use four ACS filters; F658N (H-alpha), F435W, F502N ([OIII]), & F660N ([NII]). This will be the first imaging of the outer Nebula in [OIII] and [NII]. The ACS fields are shown in red boxes in Figure 4. The orientations were chosen to maximize the coverage of the Nebula (the WFC3 and ACS fields cover about 70% of the grid observed in Cycles 12 and 13) and have at least a 5 week scheduling window according to the Visit Planner.

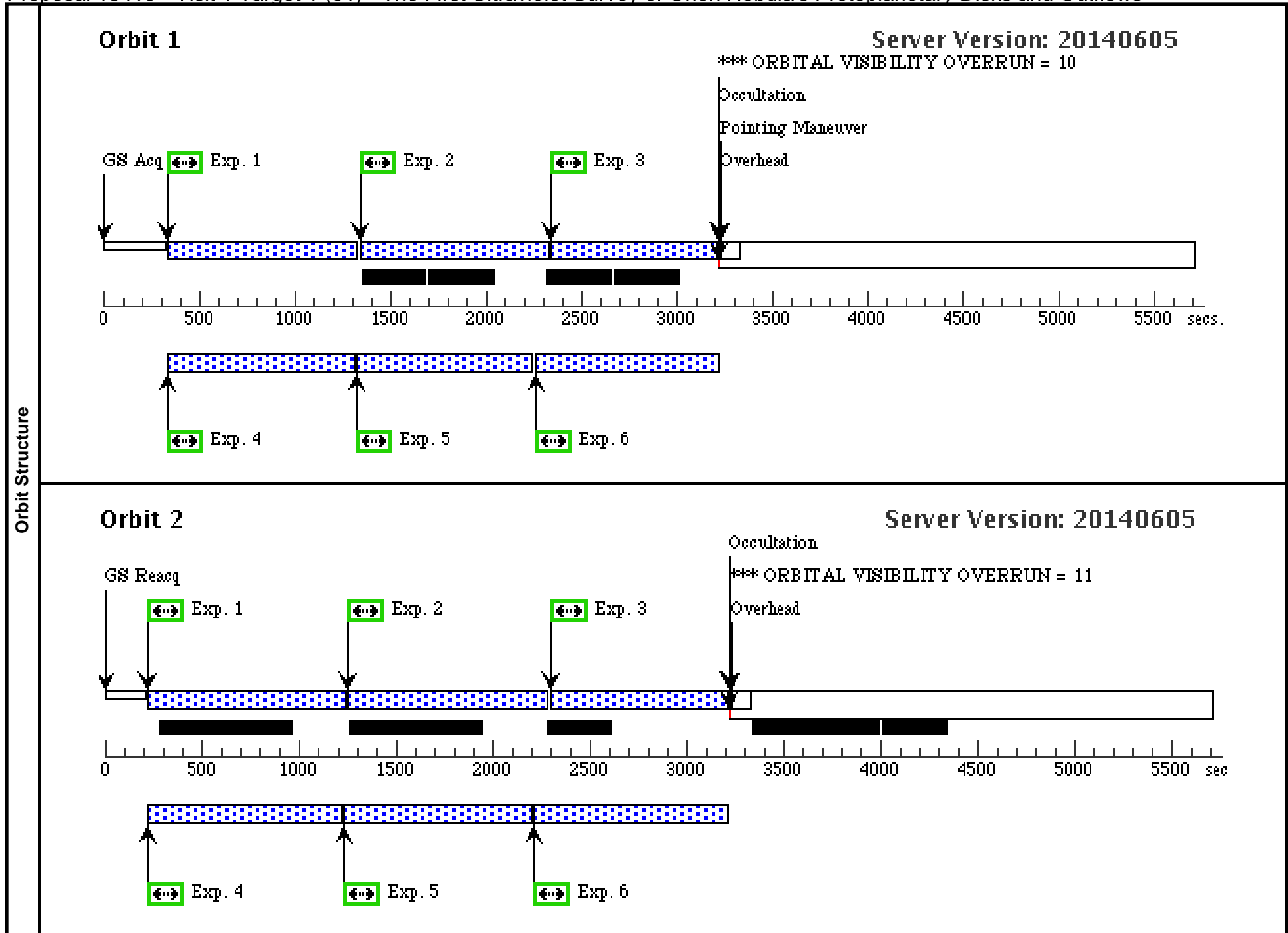
Proposal 13419 - Visit 1 Target 1 (01) - The First Ultraviolet Survey of Orion Nebula's Protoplanetary Disks and Outflows

Thu Dec 04 02:01:07 GMT 2014

Visit	Proposal 13419, Visit 1 Target 1 (01), implementation Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: ORIENT 50D TO 50 D					
	(Visit 1 Target 1 (01)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN (Visit 1 Target 1 (01)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN					
Diagnosics						
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	(1)	Pattern Type=WFC3-UVIS-DITHER- LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.145 Line Spacing= Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1-6)		
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	M42-BOX1- TRAPEZIUM-SOUTH	RA: 05 35 18.3100 (83.8262917d) Dec: -05 24 24.20 (-5.40672d) Equinox: J2000		V=7+/-1	Reference Frame: ICRS

Proposal 13419 - Visit 1 Target 1 (01) - The First Ultraviolet Survey of Orion Nebula's Protoplanetary Disks and Outflows

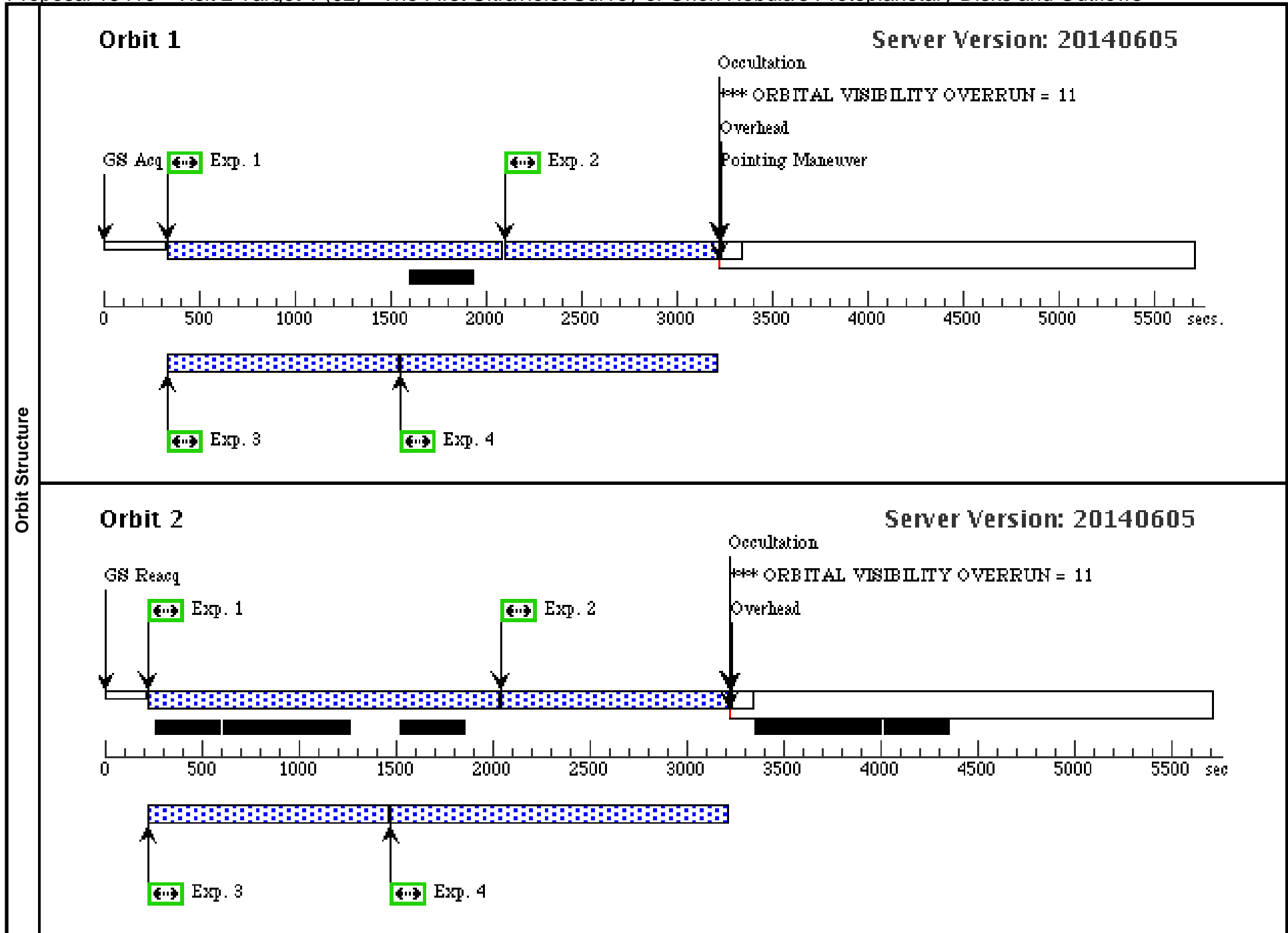
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit	
	1	WFC3/F656N	(1) M42-BOX1-TRAPEZIUM-SOUTH	WFC3/UVIS, ACCUM, UVIS-CENTER	F656N				Pattern 1, Exps 1-6 in Visit 1 Target 1 (01) (1)	848 Secs (1739 Secs)	
										[==>(Pattern 1)]	[1]
									Prime + Parallel Group 1-6 in Pattern 1, Exps 1-6 in Visit 1 Target 1 (01)	[==>891.0 Secs (Pattern 2)]	[2]
	2	WFC3/F225W	(1) M42-BOX1-TRAPEZIUM-SOUTH	WFC3/UVIS, ACCUM, UVIS-CENTER	F225W				Pattern 1, Exps 1-6 in Visit 1 Target 1 (01) (1)	848 Secs (1739 Secs)	
										[==>(Pattern 1)]	[1]
									Prime + Parallel Group 1-6 in Pattern 1, Exps 1-6 in Visit 1 Target 1 (01)	[==>891.0 Secs (Pattern 2)]	[2]
3	WFC3/F336W	(1) M42-BOX1-TRAPEZIUM-SOUTH	WFC3/UVIS, ACCUM, UVIS-CENTER	F336W				Pattern 1, Exps 1-6 in Visit 1 Target 1 (01) (1)	848 Secs (1739 Secs)		
									[==>(Pattern 1)]	[1]	
								Prime + Parallel Group 1-6 in Pattern 1, Exps 1-6 in Visit 1 Target 1 (01)	[==>891.0 Secs (Pattern 2)]	[2]	
4	ACS/F658N	(1) M42-BOX1-TRAPEZIUM-SOUTH	ACS/WFC, ACCUM, WFC	F658N				Pattern 1, Exps 1-6 in Visit 1 Target 1 (01) (1)	770 Secs (1596 Secs)		
									[==>774.0 Secs (Pattern 1)]	[1]	
								Prime + Parallel Group 1-6 in Pattern 1, Exps 1-6 in Visit 1 Target 1 (01)	[==>822.0 Secs (Pattern 2)]	[2]	
5	ACS/F502N	(1) M42-BOX1-TRAPEZIUM-SOUTH	ACS/WFC, ACCUM, WFC	F502N				Pattern 1, Exps 1-6 in Visit 1 Target 1 (01) (1)	770 Secs (1596 Secs)		
									[==>774.0 Secs (Pattern 1)]	[1]	
								Prime + Parallel Group 1-6 in Pattern 1, Exps 1-6 in Visit 1 Target 1 (01)	[==>822.0 Secs (Pattern 2)]	[2]	
6	ACS/F435W	(1) M42-BOX1-TRAPEZIUM-SOUTH	ACS/WFC, ACCUM, WFC	F435W				Pattern 1, Exps 1-6 in Visit 1 Target 1 (01) (1)	770 Secs (1596 Secs)		
									[==>774.0 Secs (Pattern 1)]	[1]	
								Prime + Parallel Group 1-6 in Pattern 1, Exps 1-6 in Visit 1 Target 1 (01)	[==>822.0 Secs (Pattern 2)]	[2]	



Proposal 13419 - Visit 2 Target 1 (02) - The First Ultraviolet Survey of Orion Nebula's Protoplanetary Disks and Outflows

Thu Dec 04 02:01:07 GMT 2014

Visit	Proposal 13419, Visit 2 Target 1 (02), implementation Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: ORIENT 50D TO 50 D										
	(Visit 2 Target 1 (02)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN (Visit 2 Target 1 (02)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN										
Diagnosics											
Patterns	#	Primary Pattern				Secondary Pattern				Exposures	
	(1)	Pattern Type=WFC3-UVIS-DITHER- LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.145 Line Spacing=				Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false				(1-4)	
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous		
	(1)	M42-BOX1-TRAPEZIUM-SOUTH	RA: 05 35 18.3100 (83.8262917d) Dec: -05 24 24.20 (-5.40672d) Equinox: J2000				V=7+/-1		Reference Frame: ICRS		
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit
	1	WFC3/F280N	(1) M42-BOX1-TRAPEZIUM-SOUTH	WFC3/UVIS, ACCUM, UVIS-CENTER	F280N	FLASH=10.0		Pattern 1, Exps 1-4 in Visit 2 Target 1 (02) (1)	1500 Secs (3261 Secs)		
									[==>1602.0 Secs (Pattern 1)]		[1]
								Prime + Parallel Group 1-4 in Pattern 1, Exps 1-4 in Visit 2 Target 1 (02)	[==>1659.0 Secs (Pattern 2)]		[2]
	2	WFC3/F373N	(1) M42-BOX1-TRAPEZIUM-SOUTH	WFC3/UVIS, ACCUM, UVIS-CENTER	F373N	FLASH=10		Pattern 1, Exps 1-4 in Visit 2 Target 1 (02) (1)	1000 Secs (2261 Secs)		
									[==>1102.0 Secs (Pattern 1)]		[1]
								Prime + Parallel Group 1-4 in Pattern 1, Exps 1-4 in Visit 2 Target 1 (02)	[==>1159.0 Secs (Pattern 2)]		[2]
	3	ACS/F658N	(1) M42-BOX1-TRAPEZIUM-SOUTH	ACS/WFC, ACCUM, WFC	F658N			Pattern 1, Exps 1-4 in Visit 2 Target 1 (02) (1)	1000 Secs (2079 Secs)		
									[==>1001.0 Secs (Pattern 1)]		[1]
								Prime + Parallel Group 1-4 in Pattern 1, Exps 1-4 in Visit 2 Target 1 (02)	[==>1078.0 Secs (Pattern 2)]		[2]
	4	ACS/F660N	(1) M42-BOX1-TRAPEZIUM-SOUTH	ACS/WFC, ACCUM, WFC	F660N			Pattern 1, Exps 1-4 in Visit 2 Target 1 (02) (1)	1500 Secs (3079 Secs)		
									[==>1501.0 Secs (Pattern 1)]		[1]
								Prime + Parallel Group 1-4 in Pattern 1, Exps 1-4 in Visit 2 Target 1 (02)	[==>1578.0 Secs (Pattern 2)]		[2]



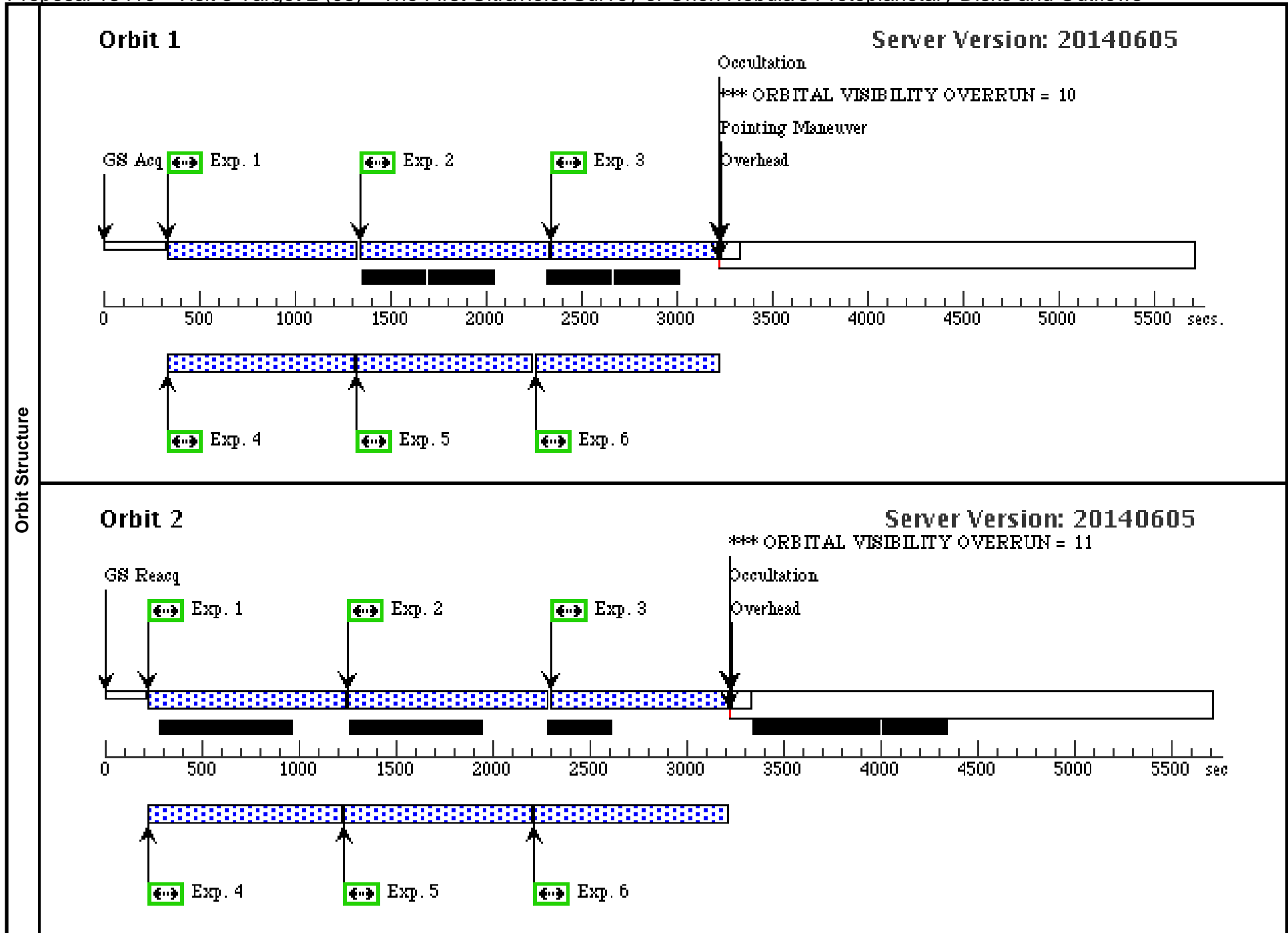
Proposal 13419 - Visit 3 Target 2 (03) - The First Ultraviolet Survey of Orion Nebula's Protoplanetary Disks and Outflows

Thu Dec 04 02:01:07 GMT 2014

Visit	Proposal 13419, Visit 3 Target 2 (03), implementation Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: ORIENT 50D TO 50 D					
	(Visit 3 Target 2 (03)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN (Visit 3 Target 2 (03)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN					
Diagnosics						
Patterns	#	Primary Pattern	Secondary Pattern	Exposures		
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Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(2)	M42-BOX2- TRAPEZIUM-WEST	RA: 05 35 7.8170 (83.7825708d) Dec: -05 24 10.70 (-5.40297d) Equinox: J2000		V=7	Reference Frame: ICRS

Proposal 13419 - Visit 3 Target 2 (03) - The First Ultraviolet Survey of Orion Nebula's Protoplanetary Disks and Outflows

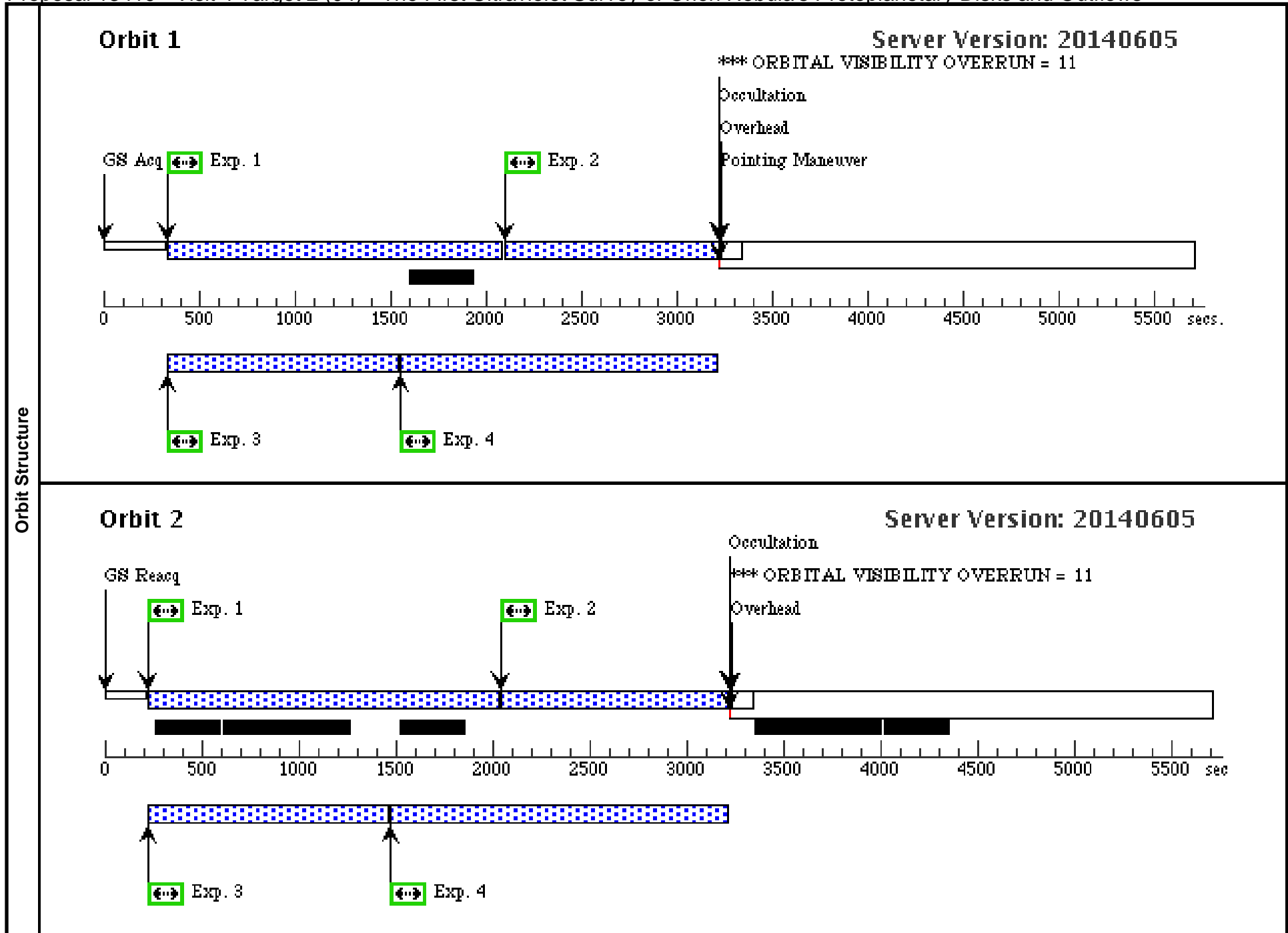
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit	
	1	WFC3/F656N	(2) M42-BOX2-TRA PEZIUM-WEST	WFC3/UVIS, ACCUM, UVIS-CENTER	F656N				Pattern 1, Exps 1-6 in Visit 3 Target 2 (03) (1)	848 Secs (1739 Secs)	
										[==>(Pattern 1)]	[1]
									Prime + Parallel Group 1-6 in Pattern 1, Exps 1-6 in Visit 3 Target 2 (03)	[==>891.0 Secs (Pattern 2)]	[2]
	2	WFC3/F225W	(2) M42-BOX2-TRA PEZIUM-WEST	WFC3/UVIS, ACCUM, UVIS-CENTER	F225W				Pattern 1, Exps 1-6 in Visit 3 Target 2 (03) (1)	848 Secs (1739 Secs)	
										[==>(Pattern 1)]	[1]
									Prime + Parallel Group 1-6 in Pattern 1, Exps 1-6 in Visit 3 Target 2 (03)	[==>891.0 Secs (Pattern 2)]	[2]
3	WFC3/F336W	(2) M42-BOX2-TRA PEZIUM-WEST	WFC3/UVIS, ACCUM, UVIS-CENTER	F336W				Pattern 1, Exps 1-6 in Visit 3 Target 2 (03) (1)	848 Secs (1739 Secs)		
									[==>(Pattern 1)]	[1]	
								Prime + Parallel Group 1-6 in Pattern 1, Exps 1-6 in Visit 3 Target 2 (03)	[==>891.0 Secs (Pattern 2)]	[2]	
4	ACS/F658N	(2) M42-BOX2-TRA PEZIUM-WEST	ACS/WFC, ACCUM, WFC	F658N				Pattern 1, Exps 1-6 in Visit 3 Target 2 (03) (1)	770 Secs (1596 Secs)		
									[==>774.0 Secs (Pattern 1)]	[1]	
								Prime + Parallel Group 1-6 in Pattern 1, Exps 1-6 in Visit 3 Target 2 (03)	[==>822.0 Secs (Pattern 2)]	[2]	
5	ACS/F502N	(2) M42-BOX2-TRA PEZIUM-WEST	ACS/WFC, ACCUM, WFC	F502N				Pattern 1, Exps 1-6 in Visit 3 Target 2 (03) (1)	770 Secs (1596 Secs)		
									[==>774.0 Secs (Pattern 1)]	[1]	
								Prime + Parallel Group 1-6 in Pattern 1, Exps 1-6 in Visit 3 Target 2 (03)	[==>822.0 Secs (Pattern 2)]	[2]	
6	ACS/F435W	(2) M42-BOX2-TRA PEZIUM-WEST	ACS/WFC, ACCUM, WFC	F435W				Pattern 1, Exps 1-6 in Visit 3 Target 2 (03) (1)	770 Secs (1596 Secs)		
									[==>774.0 Secs (Pattern 1)]	[1]	
								Prime + Parallel Group 1-6 in Pattern 1, Exps 1-6 in Visit 3 Target 2 (03)	[==>822.0 Secs (Pattern 2)]	[2]	



Proposal 13419 - Visit 4 Target 2 (04) - The First Ultraviolet Survey of Orion Nebula's Protoplanetary Disks and Outflows

Thu Dec 04 02:01:08 GMT 2014

Visit	Proposal 13419, Visit 4 Target 2 (04), implementation Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: ORIENT 50D TO 50 D										
	(Visit 4 Target 2 (04)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN (Visit 4 Target 2 (04)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN										
Diagnosics											
Patterns	#	Primary Pattern				Secondary Pattern			Exposures		
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Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes	Miscellaneous			
	(2)	M42-BOX2- TRAPEZIUM-WEST	RA: 05 35 7.8170 (83.7825708d) Dec: -05 24 10.70 (-5.40297d) Equinox: J2000				V=7	Reference Frame: ICRS			
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit
	1	WFC3/F280 N	(2) M42-BOX2-TRA PEZIUM-WEST	WFC3/UVIS, ACCUM, UVIS-CENTER	F280N	FLASH=10.0		Pattern 1, Exps 1-4 i n Visit 4 Target 2 (0 4) (1)	1500 Secs (3261 Secs)		
									[==>1602.0 Secs (Pattern 1)]		[1]
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	2	WFC3/F373 N	(2) M42-BOX2-TRA PEZIUM-WEST	WFC3/UVIS, ACCUM, UVIS-CENTER	F373N	FLASH=10		Pattern 1, Exps 1-4 i n Visit 4 Target 2 (0 4) (1)	1000 Secs (2261 Secs)		
									[==>1102.0 Secs (Pattern 1)]		[1]
								Prime + Parallel Gro up 1-4 in Pattern 1, E xps 1-4 in Visit 4 Tar get 2 (04)	[==>1159.0 Secs (Pattern 2)]		[2]
	3	ACS/F658N	(2) M42-BOX2-TRA PEZIUM-WEST	ACS/WFC, ACCUM, WFC	F658N			Pattern 1, Exps 1-4 i n Visit 4 Target 2 (0 4) (1)	1000 Secs (2079 Secs)		
									[==>1001.0 Secs (Pattern 1)]		[1]
								Prime + Parallel Gro up 1-4 in Pattern 1, E xps 1-4 in Visit 4 Tar get 2 (04)	[==>1078.0 Secs (Pattern 2)]		[2]
	4	ACS/F660N	(2) M42-BOX2-TRA PEZIUM-WEST	ACS/WFC, ACCUM, WFC	F660N			Pattern 1, Exps 1-4 i n Visit 4 Target 2 (0 4) (1)	1500 Secs (3079 Secs)		
									[==>1501.0 Secs (Pattern 1)]		[1]
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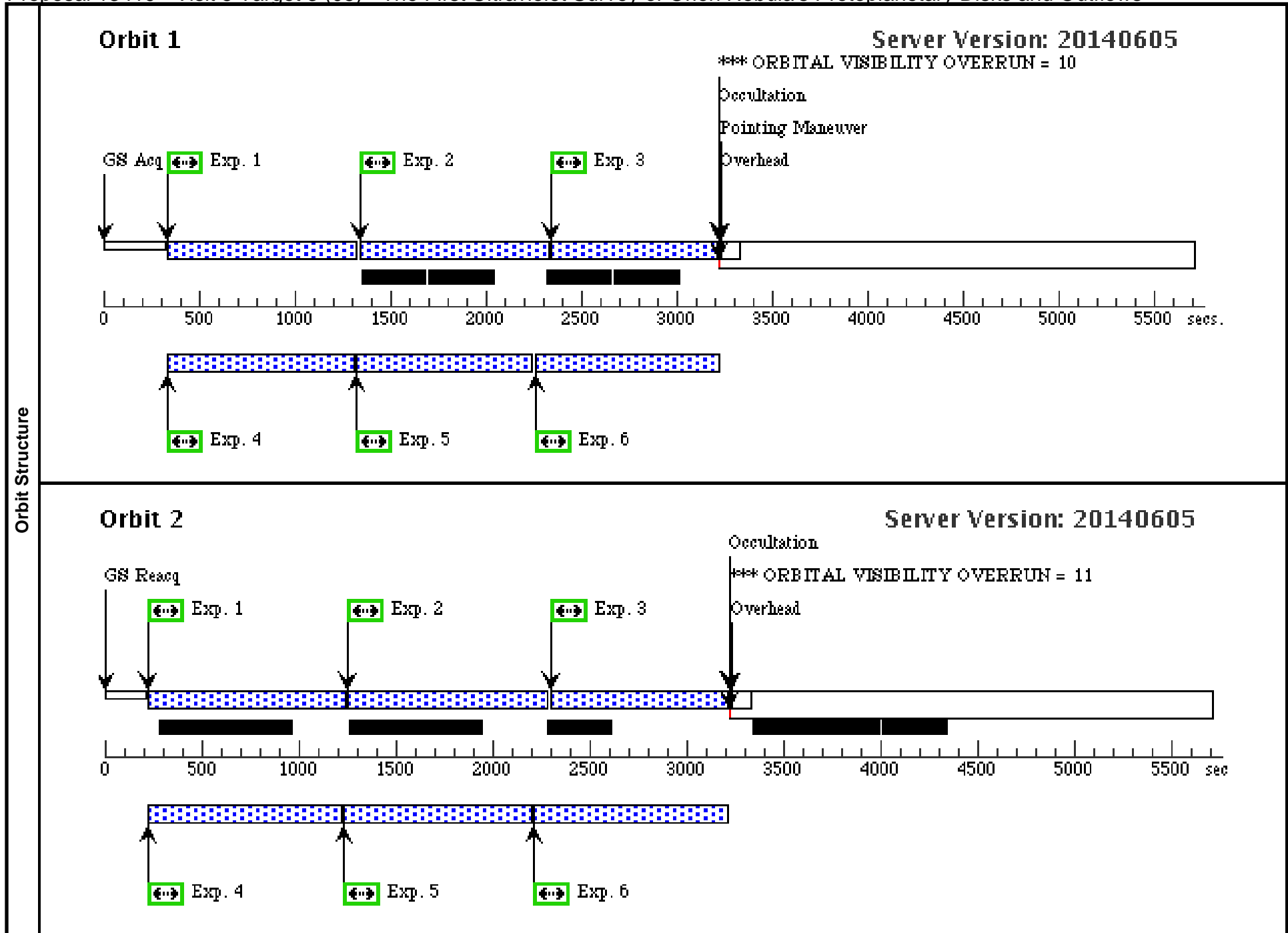
Proposal 13419 - Visit 5 Target 3 (05) - The First Ultraviolet Survey of Orion Nebula's Protoplanetary Disks and Outflows

Thu Dec 04 02:01:08 GMT 2014

Visit	Proposal 13419, Visit 5 Target 3 (05), implementation Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: ORIENT 50D TO 50 D					
	(Visit 5 Target 3 (05)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN (Visit 5 Target 3 (05)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN					
Diagnosics						
Patterns	#	Primary Pattern	Secondary Pattern	Exposures		
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Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(3)	M42-BOX3-TRAPEZIUM-NORTH	RA: 05 35 14.7770 (83.8115708d) Dec: -05 21 40.80 (-5.36133d) Equinox: J2000		V=8	Reference Frame: ICRS

Proposal 13419 - Visit 5 Target 3 (05) - The First Ultraviolet Survey of Orion Nebula's Protoplanetary Disks and Outflows

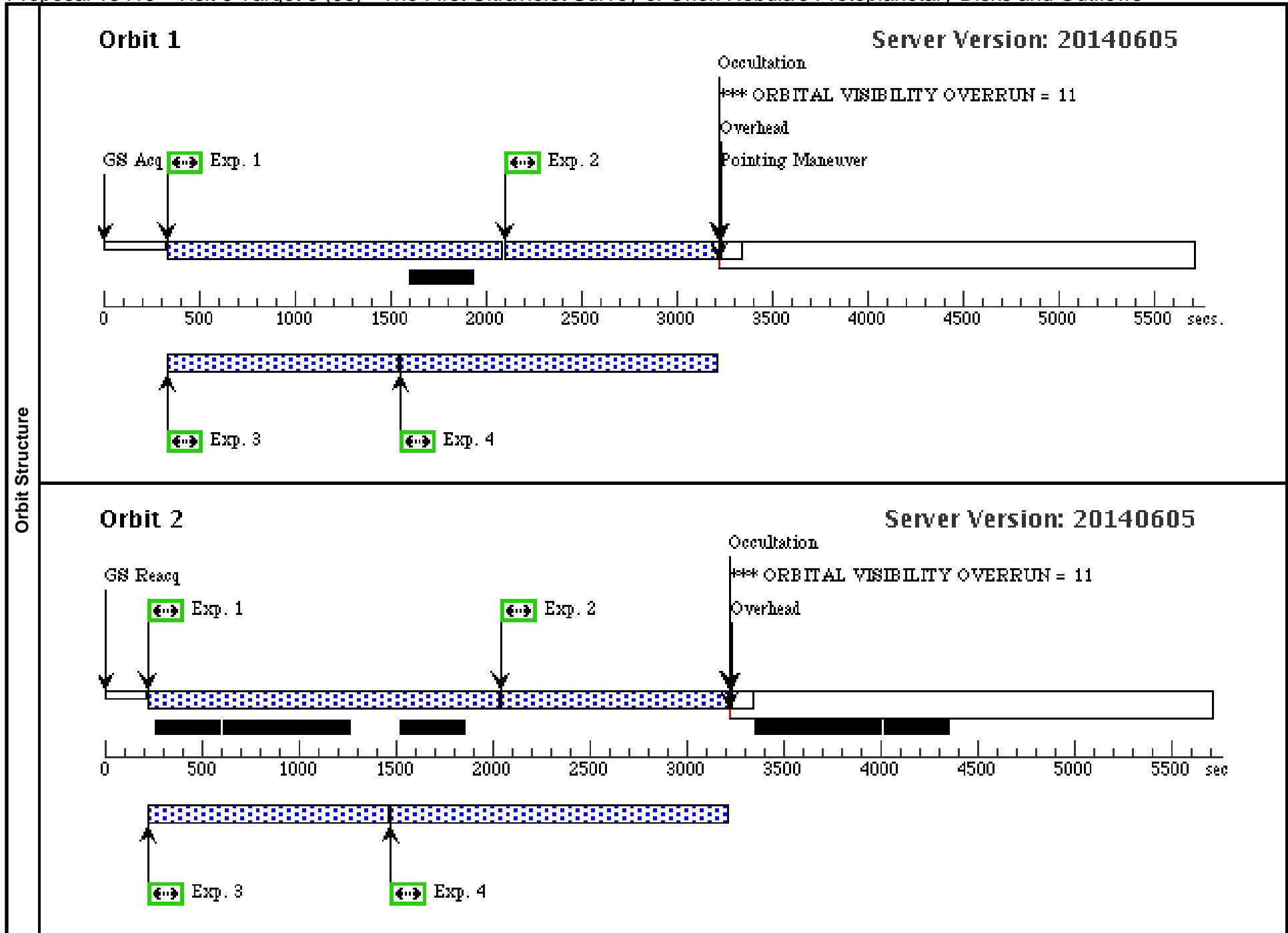
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit	
	1	WFC3/F656N	(3) M42-BOX3-TRA PEZIUM-NORTH	WFC3/UVIS, ACCUM, UVIS-CENTER	F656N				Pattern 1, Exps 1-6 in Visit 5 Target 3 (05) (1)	848 Secs (1739 Secs)	
										[==>(Pattern 1)]	[1]
									Prime + Parallel Group 1-6 in Pattern 1, Exps 1-6 in Visit 5 Target 3 (05)	[==>891.0 Secs (Pattern 2)]	[2]
	2	WFC3/F225W	(3) M42-BOX3-TRA PEZIUM-NORTH	WFC3/UVIS, ACCUM, UVIS-CENTER	F225W				Pattern 1, Exps 1-6 in Visit 5 Target 3 (05) (1)	848 Secs (1739 Secs)	
										[==>(Pattern 1)]	[1]
									Prime + Parallel Group 1-6 in Pattern 1, Exps 1-6 in Visit 5 Target 3 (05)	[==>891.0 Secs (Pattern 2)]	[2]
3	WFC3/F336W	(3) M42-BOX3-TRA PEZIUM-NORTH	WFC3/UVIS, ACCUM, UVIS-CENTER	F336W				Pattern 1, Exps 1-6 in Visit 5 Target 3 (05) (1)	848 Secs (1739 Secs)		
									[==>(Pattern 1)]	[1]	
								Prime + Parallel Group 1-6 in Pattern 1, Exps 1-6 in Visit 5 Target 3 (05)	[==>891.0 Secs (Pattern 2)]	[2]	
4	ACS/F658N	(3) M42-BOX3-TRA PEZIUM-NORTH	ACS/WFC, ACCUM, WFC	F658N				Pattern 1, Exps 1-6 in Visit 5 Target 3 (05) (1)	770 Secs (1596 Secs)		
									[==>774.0 Secs (Pattern 1)]	[1]	
								Prime + Parallel Group 1-6 in Pattern 1, Exps 1-6 in Visit 5 Target 3 (05)	[==>822.0 Secs (Pattern 2)]	[2]	
5	ACS/F502N	(3) M42-BOX3-TRA PEZIUM-NORTH	ACS/WFC, ACCUM, WFC	F502N				Pattern 1, Exps 1-6 in Visit 5 Target 3 (05) (1)	770 Secs (1596 Secs)		
									[==>774.0 Secs (Pattern 1)]	[1]	
								Prime + Parallel Group 1-6 in Pattern 1, Exps 1-6 in Visit 5 Target 3 (05)	[==>822.0 Secs (Pattern 2)]	[2]	
6	ACS/F435W	(3) M42-BOX3-TRA PEZIUM-NORTH	ACS/WFC, ACCUM, WFC	F435W				Pattern 1, Exps 1-6 in Visit 5 Target 3 (05) (1)	770 Secs (1596 Secs)		
									[==>774.0 Secs (Pattern 1)]	[1]	
								Prime + Parallel Group 1-6 in Pattern 1, Exps 1-6 in Visit 5 Target 3 (05)	[==>822.0 Secs (Pattern 2)]	[2]	



Proposal 13419 - Visit 6 Target 3 (06) - The First Ultraviolet Survey of Orion Nebula's Protoplanetary Disks and Outflows

Thu Dec 04 02:01:08 GMT 2014

Visit	Proposal 13419, Visit 6 Target 3 (06), implementation Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: ORIENT 50D TO 50 D										
	(Visit 6 Target 3 (06)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN (Visit 6 Target 3 (06)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN										
Diagnosics											
Patterns	#	Primary Pattern				Secondary Pattern			Exposures		
	(1)	Pattern Type=WFC3-UVIS-DITHER- LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.145 Line Spacing=				Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false			(1-4)		
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes	Miscellaneous			
	(3)	M42-BOX3-TRAPEZIUM-NORTH	RA: 05 35 14.7770 (83.8115708d) Dec: -05 21 40.80 (-5.36133d) Equinox: J2000				V=8	Reference Frame: ICRS			
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit
	1	WFC3/F280N	(3) M42-BOX3-TRAPEZIUM-NORTH	WFC3/UVIS, ACCUM, UVIS-CENTER	F280N	FLASH=10.0		Pattern 1, Exps 1-4 in Visit 6 Target 3 (06) (1)	1500 Secs (3261 Secs)		
									[==>1602.0 Secs (Pattern 1)]		[1]
								Prime + Parallel Group 1-4 in Pattern 1, Exps 1-4 in Visit 6 Target 3 (06)	[==>1659.0 Secs (Pattern 2)]		[2]
	2	WFC3/F373N	(3) M42-BOX3-TRAPEZIUM-NORTH	WFC3/UVIS, ACCUM, UVIS-CENTER	F373N	FLASH=10		Pattern 1, Exps 1-4 in Visit 6 Target 3 (06) (1)	1000 Secs (2261 Secs)		
									[==>1102.0 Secs (Pattern 1)]		[1]
								Prime + Parallel Group 1-4 in Pattern 1, Exps 1-4 in Visit 6 Target 3 (06)	[==>1159.0 Secs (Pattern 2)]		[2]
	3	ACS/F658N	(3) M42-BOX3-TRAPEZIUM-NORTH	ACS/WFC, ACCUM, WFC	F658N			Pattern 1, Exps 1-4 in Visit 6 Target 3 (06) (1)	1000 Secs (2079 Secs)		
									[==>1001.0 Secs (Pattern 1)]		[1]
								Prime + Parallel Group 1-4 in Pattern 1, Exps 1-4 in Visit 6 Target 3 (06)	[==>1078.0 Secs (Pattern 2)]		[2]
	4	ACS/F660N	(3) M42-BOX3-TRAPEZIUM-NORTH	ACS/WFC, ACCUM, WFC	F660N			Pattern 1, Exps 1-4 in Visit 6 Target 3 (06) (1)	1500 Secs (3079 Secs)		
									[==>1501.0 Secs (Pattern 1)]		[1]
								Prime + Parallel Group 1-4 in Pattern 1, Exps 1-4 in Visit 6 Target 3 (06)	[==>1578.0 Secs (Pattern 2)]		[2]



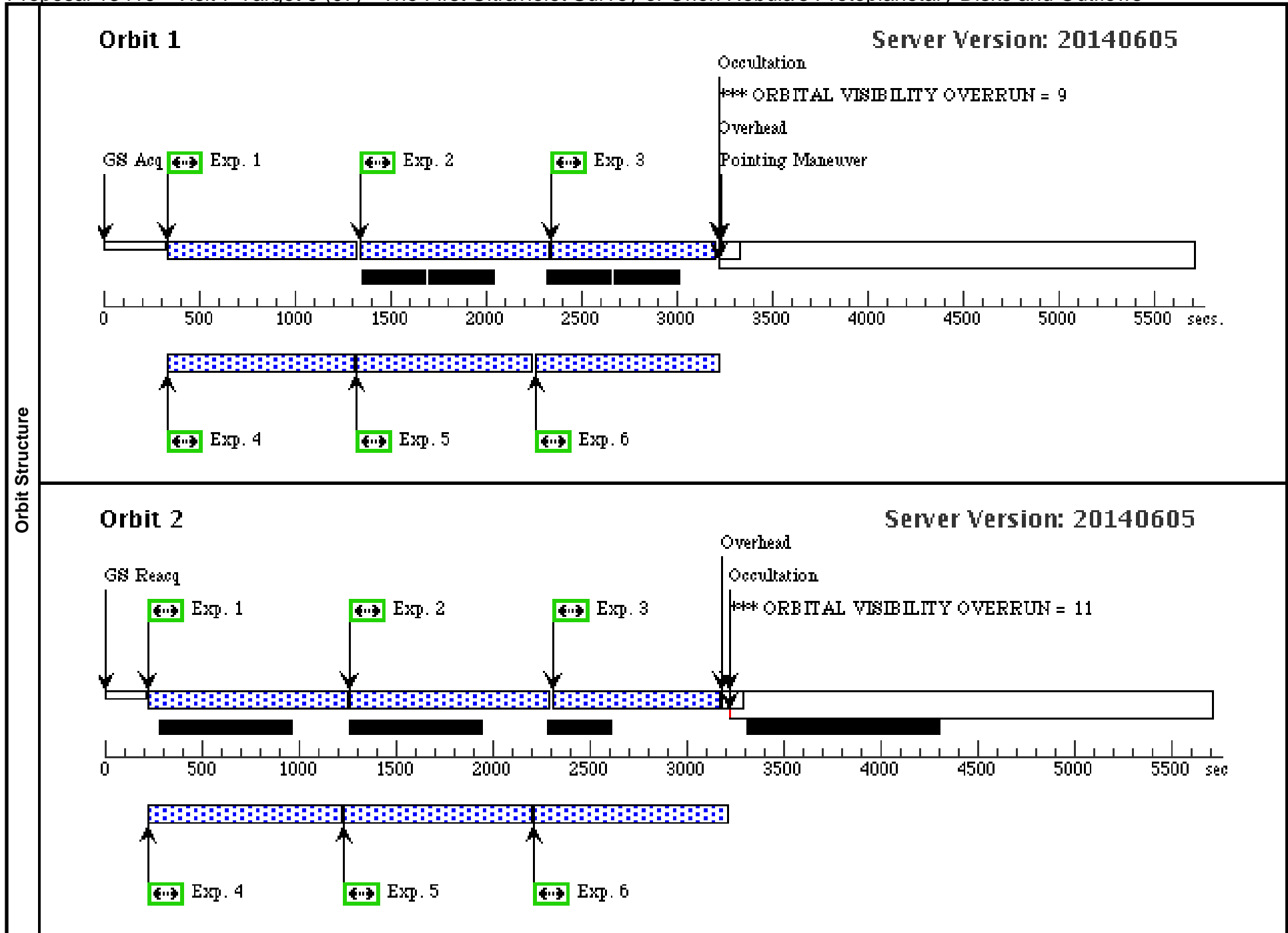
Proposal 13419 - Visit 7 Target 5 (07) - The First Ultraviolet Survey of Orion Nebula's Protoplanetary Disks and Outflows

Thu Dec 04 02:01:08 GMT 2014

Visit	Proposal 13419, Visit 7 Target 5 (07), implementation Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: ORIENT 50D TO 50 D					
	(Visit 7 Target 5 (07)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN (Visit 7 Target 5 (07)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN					
Diagnosics						
Patterns	#	Primary Pattern	Secondary Pattern	Exposures		
	(1)	Pattern Type=WFC3-UVIS-DITHER- LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.145 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1-6)	
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(5)	M43-BOX5-BAR-SOUTHEAST	RA: 05 35 28.5000 (83.8687500d) Dec: -05 24 53.00 (-5.41472d) Equinox: J2000 Plate Id: 06EL		V=10	Reference Frame: GSC1

Proposal 13419 - Visit 7 Target 5 (07) - The First Ultraviolet Survey of Orion Nebula's Protoplanetary Disks and Outflows

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit	
	1	WFC3/F656N	(5) M43-BOX5-BAR-SOUTHEAST	WFC3/UVIS, ACCUM, UVIS-CENTER	F656N				Pattern 1, Exps 1-6 in Visit 7 Target 5 (07) (1)	848 Secs (1739 Secs)	
										[==>(Pattern 1)]	[1]
	2	WFC3/F225W	(5) M43-BOX5-BAR-SOUTHEAST	WFC3/UVIS, ACCUM, UVIS-CENTER	F225W				Prime + Parallel Group 1-6 in Pattern 1, Exps 1-6 in Visit 7 Target 5 (07)	[==>891.0 Secs (Pattern 2)]	[2]
										[==>(Pattern 1)]	[1]
	3	WFC3/F373N	(5) M43-BOX5-BAR-SOUTHEAST	WFC3/UVIS, ACCUM, UVIS-CENTER	F373N		FLASH=10.0		Pattern 1, Exps 1-6 in Visit 7 Target 5 (07) (1)	848 Secs (1696 Secs)	
										[==>(Pattern 1)]	[1]
4	ACS/F658N	(5) M43-BOX5-BAR-SOUTHEAST	ACS/WFC, ACCUM, WFC	F658N				Prime + Parallel Group 1-6 in Pattern 1, Exps 1-6 in Visit 7 Target 5 (07)	[==>(Pattern 2)]	[2]	
									[==>774.0 Secs (Pattern 1)]	[1]	
5	ACS/F502N	(5) M43-BOX5-BAR-SOUTHEAST	ACS/WFC, ACCUM, WFC	F502N				Prime + Parallel Group 1-6 in Pattern 1, Exps 1-6 in Visit 7 Target 5 (07)	[==>822.0 Secs (Pattern 2)]	[2]	
									[==>774.0 Secs (Pattern 1)]	[1]	
6	ACS/F435W	(5) M43-BOX5-BAR-SOUTHEAST	ACS/WFC, ACCUM, WFC	F435W				Pattern 1, Exps 1-6 in Visit 7 Target 5 (07) (1)	770 Secs (1596 Secs)		
									[==>774.0 Secs (Pattern 1)]	[1]	
								Prime + Parallel Group 1-6 in Pattern 1, Exps 1-6 in Visit 7 Target 5 (07)	[==>822.0 Secs (Pattern 2)]	[2]	



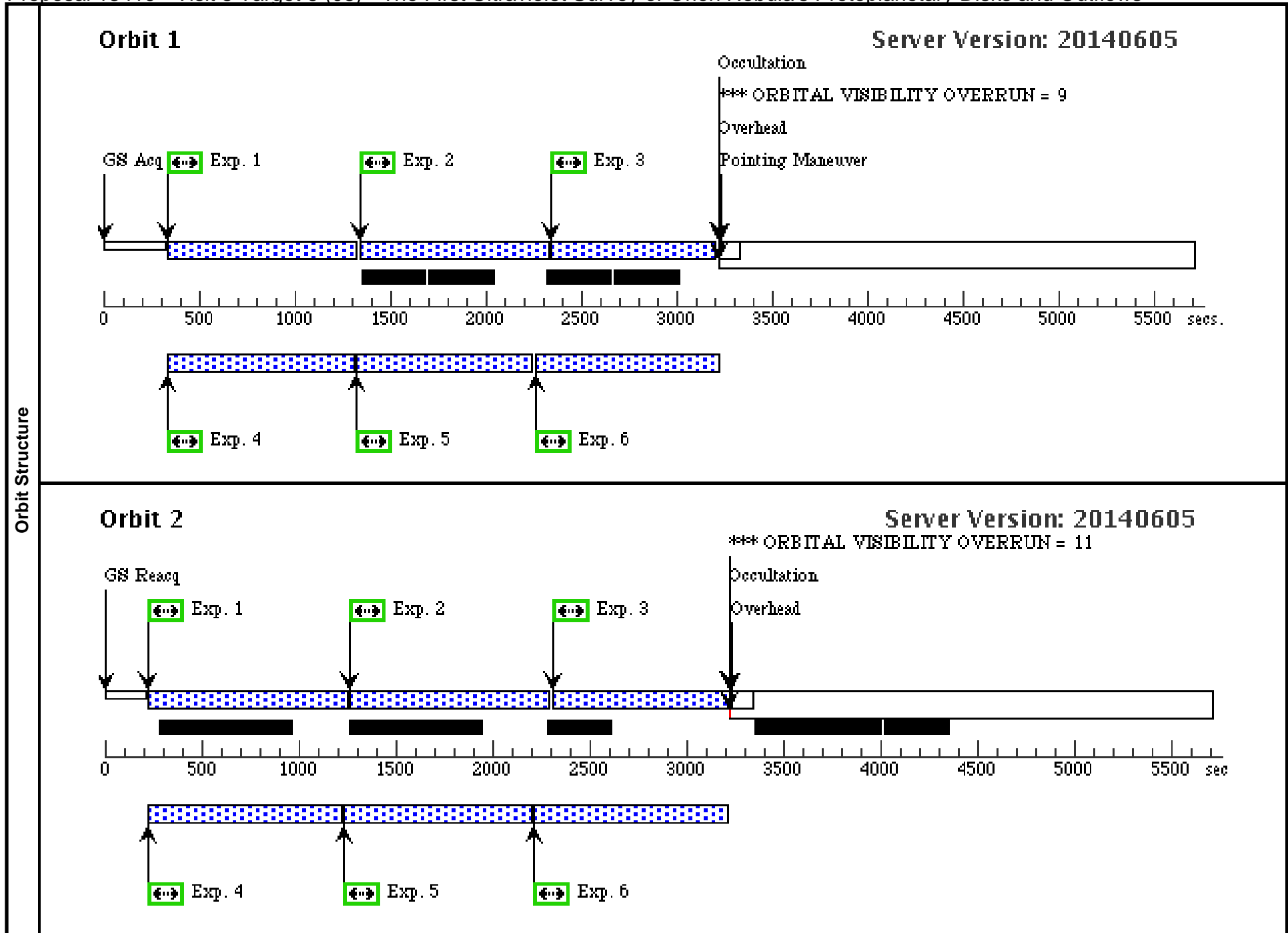
Proposal 13419 - Visit 8 Target 6 (08) - The First Ultraviolet Survey of Orion Nebula's Protoplanetary Disks and Outflows

Thu Dec 04 02:01:08 GMT 2014

Visit	Proposal 13419, Visit 8 Target 6 (08), implementation Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: ORIENT 50D TO 50 D					
	(Visit 8 Target 6 (08)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN (Visit 8 Target 6 (08)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN					
Diagnosics						
Patterns	#	Primary Pattern	Secondary Pattern	Exposures		
	(1)	Pattern Type=WFC3-UVIS-DITHER- LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.145 Line Spacing= Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1-6)		
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(6)	M42-BOX4-BEEHIVE	RA: 05 35 19.0260 (83.8292750d) Dec: -05 28 40.77 (-5.47799d) Equinox: J2000 Plate Id: 06EL		V=12	Reference Frame: GSC1

Proposal 13419 - Visit 8 Target 6 (08) - The First Ultraviolet Survey of Orion Nebula's Protoplanetary Disks and Outflows

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit	
	1	WFC3/F656N	(6) M42-BOX4-BEE HIVE	WFC3/UVIS, ACCUM, UVIS-CENTER	F656N				Pattern 1, Exps 1-6 in Visit 8 Target 6 (08) (1)	848 Secs (1739 Secs)	
										[==>(Pattern 1)]	[1]
									Prime + Parallel Group 1-6 in Pattern 1, Exps 1-6 in Visit 8 Target 6 (08)	[==>891.0 Secs (Pattern 2)]	[2]
	2	WFC3/F225W	(6) M42-BOX4-BEE HIVE	WFC3/UVIS, ACCUM, UVIS-CENTER	F225W				Pattern 1, Exps 1-6 in Visit 8 Target 6 (08) (1)	848 Secs (1739 Secs)	
										[==>(Pattern 1)]	[1]
									Prime + Parallel Group 1-6 in Pattern 1, Exps 1-6 in Visit 8 Target 6 (08)	[==>891.0 Secs (Pattern 2)]	[2]
3	WFC3/F373N	(6) M42-BOX4-BEE HIVE	WFC3/UVIS, ACCUM, UVIS-CENTER	F373N		FLASH=10.0		Pattern 1, Exps 1-6 in Visit 8 Target 6 (08) (1)	848 Secs (1739 Secs)		
									[==>(Pattern 1)]	[1]	
								Prime + Parallel Group 1-6 in Pattern 1, Exps 1-6 in Visit 8 Target 6 (08)	[==>891.0 Secs (Pattern 2)]	[2]	
4	ACS/F658N	(6) M42-BOX4-BEE HIVE	ACS/WFC, ACCUM, WFC	F658N				Pattern 1, Exps 1-6 in Visit 8 Target 6 (08) (1)	770 Secs (1596 Secs)		
									[==>774.0 Secs (Pattern 1)]	[1]	
								Prime + Parallel Group 1-6 in Pattern 1, Exps 1-6 in Visit 8 Target 6 (08)	[==>822.0 Secs (Pattern 2)]	[2]	
5	ACS/F502N	(6) M42-BOX4-BEE HIVE	ACS/WFC, ACCUM, WFC	F502N				Pattern 1, Exps 1-6 in Visit 8 Target 6 (08) (1)	770 Secs (1596 Secs)		
									[==>774.0 Secs (Pattern 1)]	[1]	
								Prime + Parallel Group 1-6 in Pattern 1, Exps 1-6 in Visit 8 Target 6 (08)	[==>822.0 Secs (Pattern 2)]	[2]	
6	ACS/F435W	(6) M42-BOX4-BEE HIVE	ACS/WFC, ACCUM, WFC	F435W				Pattern 1, Exps 1-6 in Visit 8 Target 6 (08) (1)	770 Secs (1596 Secs)		
									[==>774.0 Secs (Pattern 1)]	[1]	
								Prime + Parallel Group 1-6 in Pattern 1, Exps 1-6 in Visit 8 Target 6 (08)	[==>822.0 Secs (Pattern 2)]	[2]	



Proposal 13419 - Visit 9 Target 7 (09) - The First Ultraviolet Survey of Orion Nebula's Protoplanetary Disks and Outflows

Thu Dec 04 02:01:08 GMT 2014

Visit	Proposal 13419, Visit 9 Target 7 (09), implementation Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: ORIENT 50D TO 50 D <i>Comments: HH 502, HH 400, and many LL Ori objects</i>					
	Diagnosics (Visit 9 Target 7 (09)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN (Visit 9 Target 7 (09)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN					
Patterns	#	Primary Pattern	Secondary Pattern	Exposures		
	(1)	Pattern Type=WFC3-UVIS-DITHER- LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.145 Line Spacing= Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1-6)		
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(7)	M42-BOX7-HH502	RA: 05 35 29.0000 (83.8708333d) Dec: -05 29 50.00 (-5.49722d) Equinox: J2000 Plate Id: 06EL		V=10	Reference Frame: GSC1

Proposal 13419 - Visit 9 Target 7 (09) - The First Ultraviolet Survey of Orion Nebula's Protoplanetary Disks and Outflows

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit	
	1	WFC3/F656N	(7) M42-BOX7-HH5 02	WFC3/UVIS, ACCUM, UVIS-CENTER	F656N				Pattern 1, Exps 1-6 in Visit 9 Target 7 (09) (1)	848 Secs (1739 Secs)	
										[==>(Pattern 1)]	[1]
	2	WFC3/F225W	(7) M42-BOX7-HH5 02	WFC3/UVIS, ACCUM, UVIS-CENTER	F225W				Prime + Parallel Group 1-6 in Pattern 1, Exps 1-6 in Visit 9 Target 7 (09)	[==>891.0 Secs (Pattern 2)]	[2]
										[==>(Pattern 1)]	[1]
	3	WFC3/F373N	(7) M42-BOX7-HH5 02	WFC3/UVIS, ACCUM, UVIS-CENTER	F373N	FLASH=10.0			Pattern 1, Exps 1-6 in Visit 9 Target 7 (09) (1)	848 Secs (1739 Secs)	
										[==>(Pattern 1)]	[1]
4	ACS/F658N	(7) M42-BOX7-HH5 02	ACS/WFC, ACCUM, WFC	F658N				Prime + Parallel Group 1-6 in Pattern 1, Exps 1-6 in Visit 9 Target 7 (09)	[==>891.0 Secs (Pattern 2)]	[2]	
									[==>(Pattern 1)]	[1]	
5	ACS/F502N	(7) M42-BOX7-HH5 02	ACS/WFC, ACCUM, WFC	F502N				Pattern 1, Exps 1-6 in Visit 9 Target 7 (09) (1)	770 Secs (1596 Secs)		
									[==>774.0 Secs (Pattern 1)]	[1]	
6	ACS/F435W	(7) M42-BOX7-HH5 02	ACS/WFC, ACCUM, WFC	F435W				Prime + Parallel Group 1-6 in Pattern 1, Exps 1-6 in Visit 9 Target 7 (09)	[==>822.0 Secs (Pattern 2)]	[2]	
									[==>(Pattern 1)]	[1]	

